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WP3 – MOOC DEVELOPMENT & PILOT

3.3 Platform Definition & Integration

INNOVAT - INNOVATIVE TEACHING ACROSS CONTINENTS - UNIVERSITIES FROM EUROPE, CHILE AND PERU ON AN EXPEDITION

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CAPACITY BUILDING IN HIGHER EDUCATION – KA2 – ERASMUS+

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1. INTRODUCTION

This document presents the main results of Task 3.3 "Platform Definition & Integration" of Work Package 3 (WP3), "MOOC Development & Pilot". This document is tightly bound to the deliverable produced in Task 3.1 "Design of MOOC framework & Evaluation System," given that the platform to be used for the deployment of the MOOC must be capable of supporting the agreed MOOC design. Actually, the main objective of Task 3.3 (as defined in the project proposal) is "to decide which technology infrastructure and platform will suit best" the MOOC design, analyzing several learning platforms to make an informed decision. The design of a MOOC needs to take into account the platform where the MOOC will be deployed, because this platform imposes certain restrictions on the organization and type of content (e.g., type of supported formats, such as video, text, etc.), learners' assessment system (including the types of automatic and non-automatic correction activities), and the possibility of integrating external tools to enrich the learning experience (e.g., simulators, virtual labs, gamification, etc.).

It is important to bear in mind that Task 3.3 includes several tangible results: 1) a document with the discussion about the technological infrastructure and recommended platform for the deployment of the MOOC; 2) the platform that is eventually selected; and 3) the integration of the MOOC contents in the selected platform to carry out the corresponding pilot. This document collects the tangible results related to 1) the discussion about the technological infrastructure and recommended platform, and 2) the selected platform. The deployment of the contents in the platform to run the pilots will be carried out once Task 3.2 "Training Content Adaptation for MOOC" is completed. Task 3.2 focuses on the development of the contents for the MOOC (videos, formative activities, summative activities, discussions, etc.), and these contents will be deployed on the chosen platform. The deployment of the contents of the MOOCs in the selected platform must be iterative and incremental, taking into account the course structure with six weeks (modules) defined in the design of the MOOC. The deployment of the course should finish at least one month before its public release at the end of May 2020. With this timeline in mind, it will be possible to devote several weeks to test the course and the learning contents using beta testers, with the aim of detecting and correcting possible errors and fine-tuning the structure and learning contents in the platform.

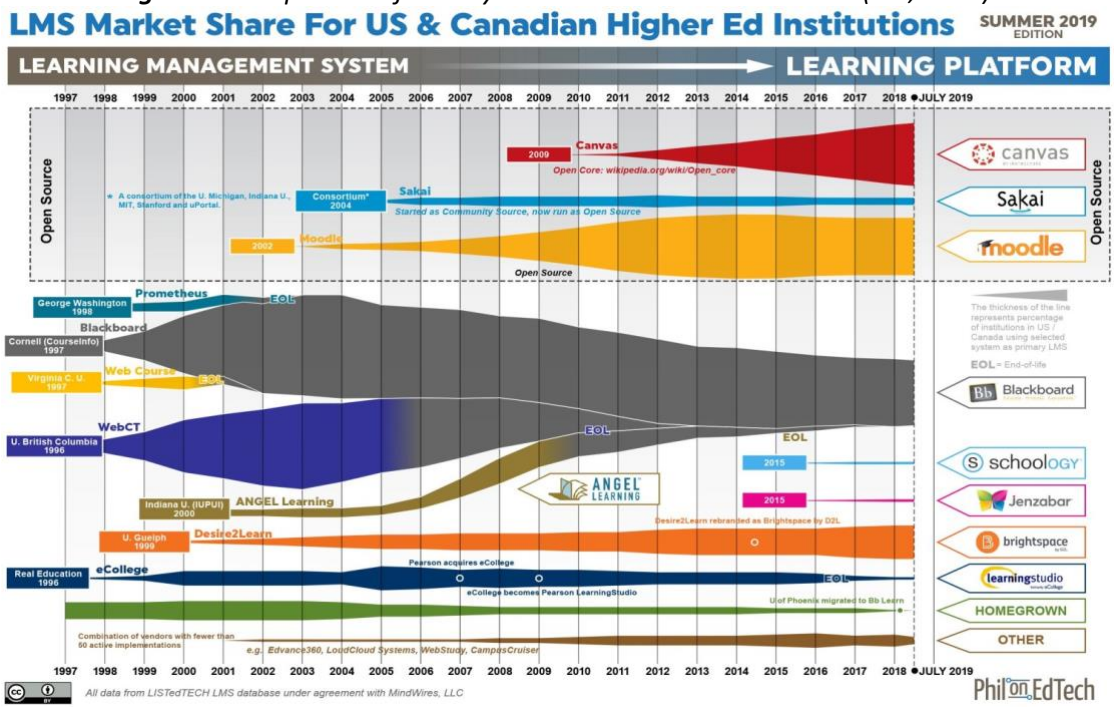
It is important to note that this document aims to serve as a guide for the consortium towards the choice of platform for deploying the MOOC. Due to the reduced allocated time for this task and the fast technological changes, it is impossible to carry out a detailed analysis of all the educational platforms available on the market. However, there are some common characteristics that platforms must meet in order to be able to support the deployment of a MOOC: 1) they must support a large number of students enrolled (massive); 2) they must allow free registration to access the learning contents (open); 3) they must allow remote access to the contents through Internet (online); and 4) they must support the deployment of the proposed design, including the main learning contents, the evaluation system and the discussion elements in an interactive and timed way (course).

2. EDUCATIONAL PLATFORMS

Learning Management Systems (LMSs) have been around since the end of the last century (see Figure 1), although they became popular in the first decade of this century due to their adoption by numerous educational institutions, including universities, but also schools and vocational training institutions. In addition, LMSs have also been used by companies and public institutions to train their staff or to train third-party staff. Among the most important LMSs, Moodle and Canvas currently stand out as open source platforms that any institution can install locally (although there are also cloud services for these LMSs) and Blackboard stands out as the main commercial solution (see Figure 1).

LMSs have been adopted for several purposes. For example, LMSs have served to support traditional face-to-face teaching, allowing teachers and institutions to have an auxiliary repository for the content used in their classes and for complementary content. This option, in which teachers use the LMSs to upload slides or PDFs as "classroom aids" (Bates, 2016), is still the most common one in the case of face-to-face education, despite the fact that LMSs have evolved to offer additional functionalities aimed at enriching students' experience. LMSs have also served to support online teaching, allowing teachers and institutions to create courses structured in lessons (or learning sequences) that combine content and activities, as well as discussion forums, among other components. The ease of installation (in the case of open source LMSs) and use, as well as the integration with institutional back-office services, have been important factors for the adoption of LMSs throughout these years. However, these first-generation LMSs were not designed to scale up to massive numbers of users or to offer open courses, although these aspects have improved with the years.

Figure 1: *Comparison of LMS by Market Share in US & Canada (Hill, 2019).*



3. MOOC INITIATIVES AND PLATFORMS

The term MOOC (Massive Open Online Course), coined by Dave Cormier in 2008, became popular in 2012, called "the year of the MOOC" (Pappano, 2012), thanks to the release of the first three MOOC initiatives, each with its own platform: Coursera, edX and Udacity. Unlike traditional LMSs, MOOC platforms, which could be referred as LMSs 2.0, were designed to support thousands of users accessing simultaneously to the same course and educational resource, to provide open courses without prior registration of the learner by the administrator or teacher, and with a more user-friendly interface than the one in first-generation LMSs.

Numerous initiatives have emerged in the last years with the aim to offer MOOCs (see Figure 2). Some of these initiatives use their own platform, while others build on open source platforms. Some of these MOOC initiatives are industry-led (whether for-profit, such as Coursera or Udacity, or non-profit, such as edX) and some others are country-led (such as FUN in France or MéxicoX in Mexico). As for the platforms underneath these MOOC initiatives, some use proprietary software such as Coursera or Udacity, while others released the code of the platforms as open source, such as edX or MiríadaX. Open edX is the open source platform underneath the edX MOOC initiative (edX.org) but has also served as the base for many other MOOC initiatives, such as FUN, XuetangX or IndonesiaX. Actually, there are currently more MOOCs on Open edX installations than on edX. It is also important to note that Open edX is being used not only to offer MOOCs, but also to offer SPOCs (Small Private Online Courses) (Fox, 2013), that is, closed online courses based on MOOC technology.

MOOC platforms share some common features. Firstly, they use video (video lectures) as the main educational component, although they support other traditional formats such as texts, slides, images, animations, etc. The activities, due to scalability reasons, are either automatic correction activities (for closed-ended questions) or peer review activities (for open-ended questions). The interaction among learners is asynchronous, again due to scalability reasons, and happens mainly in the course forum. The communication between teacher and learners is unidirectional (massive emailing) with the exception of answers to learners' questions in the course forum.

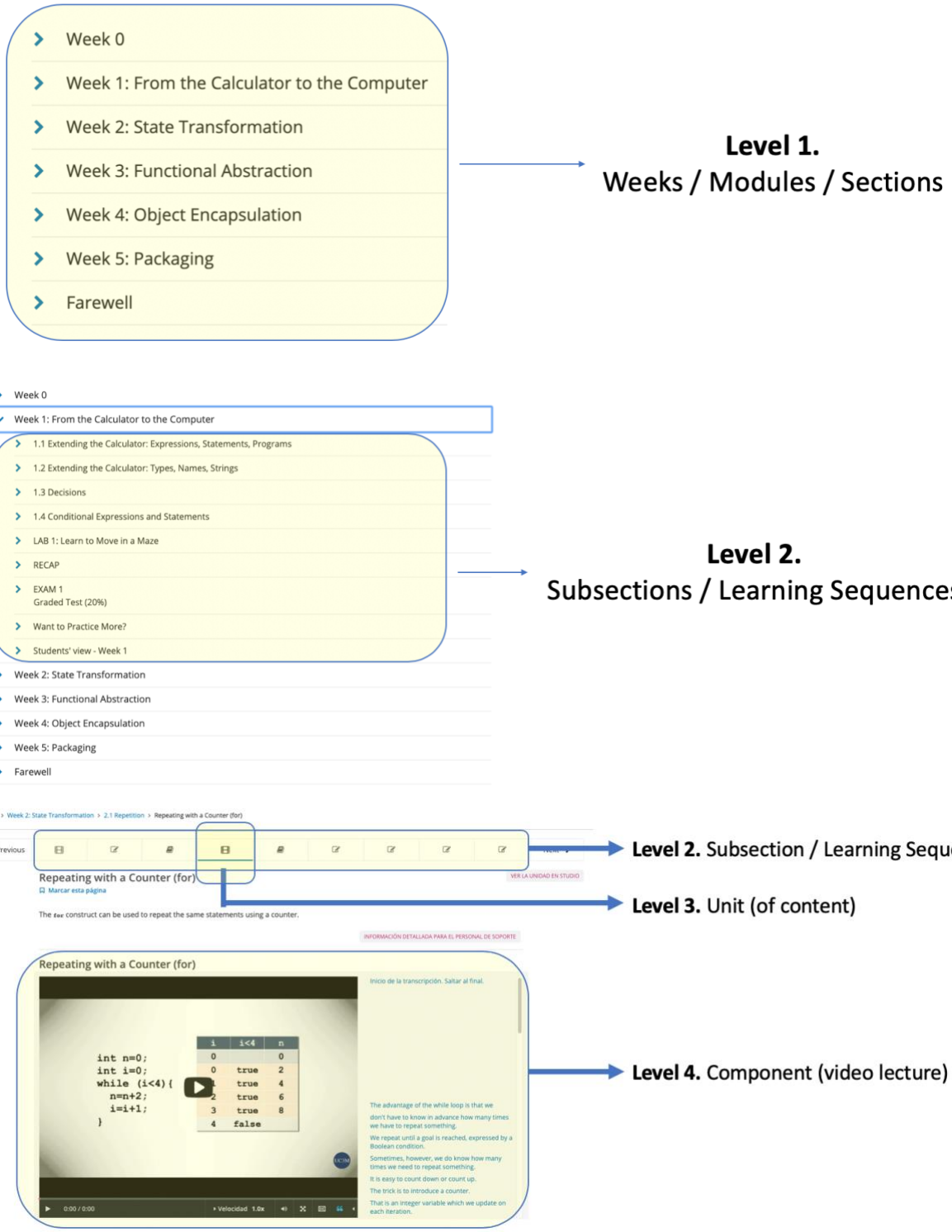
Figure 2: *Selection of some of the main MOOC initiatives.*

4. RECOMMENDED PLATFORM

After thoroughly assessing the characteristics of the MOOC to be developed, as established in Task 3.1 "Design of MOOC framework & Evaluation System," and considering that this MOOC is initially intended for a group of higher education teachers working in universities from Peru and Chile, but that later this MOOC will be open to any interested person, the platform recommended for the deployment of this course is Open edX. In fact, due to the pre-existing agreements between Universidad Carlos III de Madrid, InnovaT partner, and edX, it will be possible to deploy the course in "Edge" (https://edge.edx.org), an Open edX installation that edX provides and that allows to release open courses (anyone can enroll), but for which it is necessary to have the link to the course (hidden course), which will be available in the InnovaT project website. It is important to note that "Edge" is therefore different to edX ("edx.org"), which does allow the search for MOOCs on any topic, although the platforms that run underneath share the same characteristics.

The characteristics that make us recommend the use of "Edge" (with Open edX underneath) are the following. First, "Edge" supports the design presented in Task 3.1, including the structure of the MOOC, the contents, and the evaluation system. It is important to bear in mind that "Edge" has a four-level course structure, as can be seen in Figure 3: level 1 corresponds to the week or module; level 2 corresponds to the subsection or learning sequence; level 3 corresponds to a unit of content; and level 4 corresponds to a component (video, text, activity, forum, etc.). Second, using a cloud service such as "Edge" instead of a local installation of Open edX makes it possible to reduce the hosting costs related to buying a new server and also avoids possible problems such as shutdowns or malfunctions that can happen in local servers and that may cause the MOOC to be unavailable at certain moments, damaging the learners experience. Using a cloud service makes it easier also to keep the course active beyond the duration of the project, as a form of sustainability of the training activities on educational innovation for Latin American teachers. Third, "Edge" includes a built-in learning analytics service, called Insights, with visualization dashboards that allow making informed decisions on how to improve learners' performance, and how to improve the quality of educational contents, such as videos and activities, based on logs and low-level data. The improvement of the course contents based on learning analytics is considered essential to improve the MOOC in subsequent runs. Fourth, the deployment of the course in "Edge" allows the course to be export and import in other Open edX installation, as "Edge" uses Open edX underneath. For example, if other educational institutions want to reuse the course or part of its content and install it in a local Open edX, they will only need to import the file that will be available on the InnovaT project website with the full course exported from "Edge" to start running the course locally. Last but not least, "Edge", together with Open edX, represent a state-of-the-art powerful, scalable, open source platform that has been used worldwide in numerous national and industry-led initiatives for offering MOOCs, with very positive results.

Figure 3: *Four-level content structure in the edX / Open edX platform.*



REFERENCES

- Bates, T. (2016). Are you ready for blended learning? *Online Learning and Distance Education Resources*. Retrieved from: https://www.tonybates.ca/2016/12/12/are-we-ready-for-blended-learning/. Last visited: November 2019.
- Fox, A. (2013). From MOOCs to SPOCs. *Communications of the ACM, 56*(12), 38-40.
- Hill, P. (2019). State of Higher Ed LMS Market for US and Canada: 2019 Mid-Year Edition. *Phil on EdTech*. Retrieved from: https://philonedtech.com/state-of-higher-ed-lms-market-for-us-and-canada-2019-mid-year-edition/. Last visited: November 2019.
- Pappano, L. (2012). The Year of the MOOC. *The New York Times, 2*(12), 2012.